EXECUTIVE SUMMARY

Section 10 of Engrossed Substitute House Bill 2496 (Salmon Recovery Act of 1998), directs the Washington State Conservation Commission, in consultation with local government and treaty tribes to invite private, federal, state, tribal, and local government personnel with appropriate expertise to convene as a Technical Advisory Group (TAG). The purpose of the TAG is to identify limiting factors for salmonids. Limiting factors are defined as "conditions that limit the ability of habitat to fully sustain populations of salmon, including all species of the family Salmonidae." The bill further clarifies the definition by stating "These factors are primarily fish passage barriers and degraded estuarine areas, riparian corridors, stream channels, and wetlands."

The intent of the legislation and watershed restoration is to provide healthy, productive runs of salmon that will support sport, commercial, and tribal fisheries, and for future generations. This will require management to a higher standard than just minimum viable habitat. Although there remains some debate on specific habitat thresholds necessary for productive salmon habitat, there is broad consensus that salmon require:

- cool, clean, well-oxygenated water,
- instream flows that mimic the natural hydrology of the watershed, maintaining adequate flows during low flow periods and minimizing the frequency and magnitude of peak flows (stormwater),
- clean spawning gravels not clogged with fine sediment or toxic materials,
- presence of instream pools that will support juvenile rearing and resting areas for returning adults,
- abundance of instream large woody debris, particularly large key pieces, that provide cover, create pools, and provide habitat diversity,
- free, unobstructed migration for juveniles and adults to and from the stream of origin,
- broad, dense riparian stands of mature conifer that provides cover, shade, LWD recruitment, etc., and
- estuarine conditions that support production of prey organisms for juvenile outmigrants as well as for rearing and returning adults.

A discussion of the role of healthy habitat is included in Appendix 1.

The following report has been prepared in accordance with the above instructions for Water Resource Inventory Area 13 – Deschutes (Figure 1). It is important to note that the responsibilities given to the Conservation Commission in ESHB 2496 do not constitute a full limiting factors analysis. This report is based on a combination of existing watershed studies and knowledge of the TAG participants. A full habitat limiting factors analysis would require extensive new scientific studies for each of the subwatersheds in WRIA 13. The hatchery, hydro, and harvest segments important to a full limiting factors analysis will be dealt with in other forums.

Habitat limiting factors are presented in separate chapters:
- by habitat factor type, to identify the magnitude of a specific factor across the streams in the WRIA, and
- by individual watershed, to identify the scope of limiting factors within each specific watershed.
- Table 1 summarizes the scope of specific known habitat limiting factors in WRIA 13, and which factors are applicable to any particular stream or watershed.

Data included in this report include formal habitat inventories or studies specifically directed at evaluating fish habitat, other watershed data not specifically associated with fish habitat evaluation, and personal experience and observations of the watershed experts involved in the TAG. Watershed studies were limited within the WRIA, particularly studies specifically directed at evaluating fish habitat. Although the data were scattered, and the specific habitat concerns differed between streams, there are some common habitat themes, including:

- natural stream ecological processes have been significantly altered due to adjacent land management practices and direct actions within the stream corridor,
- fine sediment (<.85 mm) levels in the stream gravels regularly exceed the <12% level identified as representing suitable spawning habitat,
- lack of adequate large woody debris in streams, particularly larger key pieces that are critical to developing pools, log jams, and other habitat components important to salmonids,
- lack of adequate pool frequency and large, deep pools that are important to rearing juvenile salmonids and adult salmonids on their upstream migration,
- naturally high rates of channel in this geologically young basin, but further exacerbated rate of steambank erosion and substrate instability due to loss of streambank and riparian integrity, and alteration of natural hydrology,
- loss of riparian function due to removal/alteration of natural riparian vegetation, which affects water quality, lateral erosion, streambank stability, instream habitat conditions, etc.,
- the presence of a significant number of culverts/screens/dams/etc. that preclude unrestricted upstream or downstream access to juvenile and adult salmonids,
- significant alterations to the natural stream hydrology in streams where the uplands have been heavily developed, and the threat of similar impacts to streams that are experiencing current and future development growth, and
- estuarine/marine function is significantly impacted by physical alteration of the natural estuary, by poor water quality in the estuary, and by significant alteration of nearshore ecological function due to shoreline armoring.

Few, if any, of the habitat data/observations meet the highest standard of peer review literature, but should nevertheless be considered as valid, as they are based on the experience of the watershed experts that are actively working in these streams. There are a number of data gaps, which will require additional specific watershed research or evaluation.

Protection/restoration of salmonid resources can not be accomplished by watershed restoration projects alone. It is unlikely that we will be able to get ourselves out of this salmon predicament using the same land management approaches that got us into it. We will need to look at the watershed with a clear new vision. Salmonid recovery will require a combination of efforts, including:

- revision, implementation, and enforcement of land use ordinances that provide protection for natural ecological processes in the marine, instream, and riparian corridors, including measures to maintain effective impervious surfaces to levels, and in a manner, that will maintain natural hydrology,
- protection of marine, instream, and riparian habitat that is currently functioning, particularly key habitat areas, and
- restoration of natural marine, instream, and riparian ecological processes where they have been impaired.

In addition, the status of chinook in Woodland, Percival/Black Lake Ditch, and McLane creeks should be reviewed to determine whether these are the result of self perpetuating spawners, or whether chinook returns are strictly the result of Deschutes River hatchery strays.

Table 1: Identified habitat limiting factors for freshwater streams and marine areas of WRIA 13

STREAM NAME	WRIA INDEX	Fish Passage	Floodplain Connectivity	Bank Stability	LWD	Pools	Side Channel Habitat	Substrate Fines	Riparian	Water Quality	Water Quantity	Biological Processes	Lakes	Estuarine
Unnamed	13.0001									X	X			
Dobbs Creek	13.0005									X	X			
Woodland Creek	13.0006	X		X	X			X	X	X	X			
"Fox Hollow Cr."	13.0007													
Jorgenson Cr.	13.0008	X						X						
Fox Cr.	13.0009	X												
Eagle Creek	13.0010	X		X				X						
Woodard Creek	13.0012	X			X				X	X	X			
Sleepy Creek	13.0015									X				
Adams Creek	13.0018	X								X				
Unnamed	13.0021	X								X				
Ellis Creek	13.0022	X						X		X				
Mission Creek	13.0025									X				
Indian Cr.	13.0026	X						X		X				
Moxlie Cr.	13.0027	X						X		X				
Percival Creek	13.0029	X		X	X	X		X	X	X	X		X	X
Black Lake Ditch	13.0030	X		X	X	X		X	X	X	X		X	X
Deschutes River	13.0028			X	X	X	X	X	X	X	X		X	X
Unnamed	13.0032													
Chambers Cr.	13.0033							X	X	X	X			
Unnamed	13.0034							X	X	X	X			
Unnamed	13.0036									X				
Spurgeon Cr.	13.0037									X				
Offut Lake Outlet	13.0040	X												
Silver Springs	13.0041													
Unnamed	13.0042													
Unnamed	13.0045	X												

STREAM NAME	WRIA INDEX	Fish Passage	Floodplain Connectivity	Bank Stability	LWD	Pools	Side Channel Habitat	Substrate Fines	Riparian	Water Quality	Water Quantity	Biological Processes	Lakes	Estuarine
Reichel Cr.	13.0046										X			
Unnamed	13.0047	X												
Pipeline Cr.	13.0051													
Unnamed	13.0052													
Hull Cr.	13.0053													
Fall Cr.	13.0057			X										
Unnamed	13.0066													
Mitchell Cr.	13.0069			X	X									
Huckleberry Cr.	13.0086			X	X			X	X					
Johnson Cr.	13.0089			X	X			X						
Thurston Cr.	13.0095			X	X									
Unnamed	13.0097			X	X									
Unnamed	13.0102													
Unnamed	13.0104						X							
Schneider Cr.	13.0131									X				
Green Cove Creek	13.0133				X	X			X					
Unnamed	13.0135													
Houston Creek	13.0137	X												
McLane Creek	13.0138				X	X		X	X					
Swift Cr.	13.0139	X			X	X		X	X					
Perkins Creek	13.0140	X												
Cedar Flats Cr.	13.0141													
Unnamed	13.0142													
Beatty Cr.	13.0143	X												
Henderson Inlet	13.MAR									X				X
Budd Inlet	13.MAR									X				X
Eld Inlet	13.MAR									X				X

NOTE: Absence of "X" indicator is typically a result of lack of applicable studies or data, rather than an affirmative indication that the concern is not applicable to a particular stream.